Market Analysis
Program (MAP)

Industry Sector Markets 1988-1993

Wholesale Distribution Sector

INPUT®

1280 Villa Street, Mountain View, CA 94041 (415) 961-3300

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INDUSTRY SECTOR MARKETS 1988-1993

WHOLESALE DISTRIBUTION SECTOR

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I

Introduction

A

Environment/ Overview

The wholesale distribution industry sector is one of the largest in terms of employment, as shown in Exhibit I-1. It includes many small establishments, although often the ratio of sales per employee is high.

The environment of the wholesale distribution sector, as well as the competitive and user activities described in Chapters III and IV, was analyzed by utilizing material from the surveys conducted for the INPUT *Information Systems Planning Report* and CAMS vendor data base, as well as from 20 additional interviews of information systems (IS) managers, users, and vendors who work in or serve this sector. This material was also utilized, together with the INPUT data base and files, to prepare the forecast in Chapter II.

The environmental picture that emerges from the analysis provides further understanding of the opportunities and challenges of the sector.

Wholesale distribution, the distribution of durable and nondurable goods to retail distributors as well as to fabricators and manufacturers, is a more attractive current environment for information service vendors than some assessments or audits portray. The widespread interest in computerization and usage of new information technology within this vertical market is diluted in aggregate figures (about the use of IS products) by the large number of smaller wholesalers that handle groceries and various supplies and materials and are run by a small number of people.

- Verticomp, an information service vendor in Massachusetts offering software and turnkey systems, notes that IS firms in every industrial region of the country are experiencing a surge in requests for service from wholesalers in their areas.

- A group of vendors in this sector—including Imrex, Unisol and Harris Data Services—have grown 100% to 300% during the last three to four years.

EXHIBIT I-1

WHOLESALE DISTRIBUTION INDUSTRY SECTOR—DEMOGRAPHIC DATA

Standard Industrial Classification	Industry Name	Type of Statistic	Data
50-51	Wholesale Trade	Total Sales (1985 Estimate) Number of Establishments (1985) Number of Employees (1985)	$1,998.0 Billion 438,141 5.7 Million
501	Motor Vehicles & Automotive Equipment	Total Sales (1985) Number of Establishments (1985) Number of Employees (1985)	$132.4 Billion 39,251 452,000
502	Furniture	Total Sales (1985) Number of Establishments (1985) Number of Employees (1985)	$24.2 Billion 12,987 139,000
503	Lumber and Construction	Total Sales (1982) Number of Establishments (1985) Number of Employees (1985)	$46.2 Billion 18,131 217,000
504	Sporting Goods and Toys	Total Sales (1985) Number of Establishments (1985) Number of Employees (1985)	$26.9 Billion 7,633 90,000
505	Metals and Minerals	Total Sales (1985) Number of Establishments (1985) Number of Employees (1985)	$60.9 Billion 10,080 141,000
506	Electrical Goods	Total Sales (1985) Number of Establishments (1985) Number of Employees (1985)	$88.8 Billion 31,259 423,000
507	Hardware, Plumbing and Heating	Total Sales (1985) Number of Establishments (1985) Number of Employees (1985)	$41.2 Billion 21,280 227,000
508	Machinery and Equipment	Total Sales (1985) Number of Establishments (1985) Number of Employees (1985)	$165.8 Billion 102,588 1.3 Million

(Continued)

EXHIBIT I-1 (Con't)

WHOLESALE DISTRIBUTION INDUSTRY SECTOR— DEMOGRAPHIC DATA

Standard Industrial Classification	Industry Name	Type of Statistic	Data
509	Miscellaneous Durables	Total Sales (1985 Estimate) Number of Establishments (1985) Number of Employees (1985)	$54.5 Billion 23,147 189,000
511	Paper and Paper Products	Total Sales (1985) Number of Establishments (1985) Number of Employees (1985)	$36.8 Billion 14,530 214,000
512	Drugs and Sundries	Total Sales (1985) Number of Establishments (1985) Number of Employees (1985)	$27.6 Billion 4,031 110,000
513	Apparel Piece Goods and Notions	Total Sales (1982) Number of Establishments (1985) Number of Employees (1985)	$55.9 Billion 15,558 159,586
514	Groceries & Related Products	Total Sales (1985) Number of Establishments (1985) Number of Employees (1985)	$217.1 Billion 39,694 716,000
515	Farm Products	Total Sales (1985) Number of Establishments (1985) Number of Employees (1985)	$93.3 Billion 13,095 123,000
516	Chemicals and Allied Products	Total Sales (1982) Number of Establishments (1985) Number of Employees (1985)	$76.1 Billion 11,163 124,000
517	Petroleum and Petroleum Products	Total Sales (1982) Number of Establishments (1985) Number of Employees (1985)	$297.0 Billion 17,348 183,000

Source: U.S. Department of Commerce

- A number of vendors now supply integrated application software to meet the demands from wholesalers for upgraded computerization.

- Both IBM, through its AS/400 announcements, and Digital Equipment, in three full-page advertisements in *Business Week* in mid-1988, have highlighted their interest in serving wholesale distribution.

- Expanding use of automatic data analysis and ordering based on POS data transmitted to wholesalers, and automatic billing and payment via networks, demonstrate increased reliance on EDI.

An overview of wholesale distribution reveals a set of mixed economic signals that indicate opportunities for vendors.

- Durable goods, such as industrial and electrical supplies, have been favorably impacted by the recent surge in manufacturing. More than 60% of distributors handle durable goods.

- Nondurable goods include fast-moving items that are profitable for wholesalers, such as pharmaceuticals. Computerization can aid service, as well as slow-moving or low-margin goods, such as groceries, where new or improved small systems can control and reduce costs.

The independent distributors, who number over 415,000 and handle about 55% of wholesale distribution, are growing in total industry sales, although the growth of individual firms is dependent on the submarkets they serve.

In addition to the independent distributors, manufacturers and independent agents or brokers account for portions of wholesale distribution.

- Manufacturers who handle their own distribution account for about 35% of the market. Foreign manufacturers expanding business in the U.S. could add to or replace some of this distribution business and provide new prospects for vendors.

- The independent agents and brokers, who account for less than 10% of the business today, are in the process of contraction. Specialized IS products are needed in this submarket to manage stocks and handle accounting.

Size is a major factor affecting the needs of independent wholesale distributors.

- There are about 6,000 large companies (less than 2% of independents) that have sales over $25 million. They control almost half of sales in the wholesale distribution market. These firms in general have multiple offices and carry goods of several types (e.g., industrial parts,

electrical apparatus, and business machines). They have significant interest in advances in information service technology, such as:

- EDI networks for ordering and payment
- The use of POS data from retail customers (forward integration) for ordering, forecasting, or distribution resource planning.
- New OLTP (on-line transaction processing) applications.
- Automated warehouses

Wholesale distributors with less than $25 million but more than $5 million in sales number about 35,000. These companies are driven in general by attempts to gain revenue and reduce costs so that they can be less subject to contraction in custom industries or to new competitive tactics. These companies are highly interested in obtaining or upgrading computer application systems to improve service and reduce costs.

- Turnkey systems and packaged applications that are tailored to current needs for entering customer orders, providing status on inventory stock, processing orders, managing inventory, tracking and forecasting sales, and handling accounting are being sought by firms of this size.
- This segment is also interested in obtaining benefits from selected new developments, such as electronic data interchange (EDI), that are proven by larger distributors and that are obviously suited to current needs. Wholesalers of this size are wary of new developments that have not been proven.

Independent wholesale distributors with below $5 million in annual sales are more than ten times as numerous as the segment just discussed (over 370,000 companies). These firms will continue to experience consolidation, acquisition by larger firms, and failure as a result of current cost pressure on margins from warehouse and personnel costs, extreme delay in receivable payments, and softness in some customer product segments, particularly in nondurable goods. These companies are looking for low-priced computing solutions to their problems.

- Turnkey systems or application packages based on micros are of great interest in this segment. However, price is of such importance to small, independent wholesale distributors that vendors serving this segment must consider distributing their software through retail computer stores, VARs, or other means.
- One IS vendor, Micro DataNet, notes that many of these small wholesale distributors are quite interested in having low-priced, cross-industry applications tailored to their need to obtain economic solutions.

Micro DataNet has developed applications for food and other wholesalers by modifying integrated accounting applications developed for PCs.

Distribution operations of manufacturers have computing system needs that are generally similar to the needs of larger independent wholesale distributors. EDI, warehouse automation, faster OLTP (on-line transaction processing) for order entry, and DRP (distribution resource planning) are of particular interest.

B

Industry Trends

One of the most significant trends in wholesale distribution is the continuing pressure on profit margins resulting from the costs of storing and financing, transportation, inventory, processing orders, and carrying receivables. These pressures have kept margins low, typically between 2% and 3%.

- Both manufacturers and retailers are contributing to this trend by attempting to reduce inventories and have distributors quickly respond to needs. Just-in-time delivery for manufacturers can add to pressures for wholesalers.

- Wholesale distributors, particularly smaller ones, can find it difficult to delay supplying goods to their customers even when payment has been delayed, which contributes to margin problems.

The foregoing trend highlights the interest in EDI, since it can speed up the ability to obtain orders and receive payment.

The trend for smaller distributors to merge or be acquired continues, primarily as a result of the pressure on profit margins. The addition of new product lines makes a wholesaler with limited products less subject to softness in demand. A larger volume of business also provides more cushion to withstand loss of accounts and competitive tactics.

There is an important trend toward interdependent or linked business applications between wholesale distributors and their customers. Customers utilize terminals or PCs to make inquiries and, after analysis at their sites, they enter orders. Wholesalers obtain POS data from retailers. Wholesalers use the data to forecast needs and plan inventory levels and shipments. Wholesalers may also provide information on terminals at customer sites, which helps retail stores or manufacturers to plan what they need as well as enter orders.

A trend exists for wholesale distributors in general to provide more services to customers. This can increase revenues and margins as well as establish tighter links with customers. Of course, the cost of providing such services can rise also.

- Some wholesalers may supply more information about industrial parts, electrical apparatus, or pharmaceuticals (as Abbott Laboratories does) to aid customers.

- McKesson Robbins uses a much-heralded automated system to aid druggists in ordering various items.

The trend to aid customers has been accompanied by an increasing emphasis on consultative selling by wholesalers and vendors serving them. This promotes the concept of vendors' gaining more knowledge of customer business and offering solutions to problems before clients have studied the situation and gathered the information necessary for a bid process.

Some of the most important challenges include addressing an industry where there exists:

- A plethora of widely different submarkets such as industrial machinery, petroleum products, grocery and food products, hardware, automotive, toys, furniture, and a dozen other submarkets, many with different information services requirements

- Widely differing growth rates among industry subsectors

- Some very large wholesale distribution firms that are leading-edge implementers of computer technologies and many thousands of very small firms, many of which have only recently begun to implement information systems

- Some of the broadest technological and application challenges facing the computer users of any industry.

As the previous section indicated, although the industry affords ample opportunity for revenue growth among certain delivery modes—for example sales of software products and turnkey systems—it presents a problem for vendors serving slowly growing segments or applications.

Market share is an important indicator of relative market strength; one percentage point represents approximately $4 billion in sales.

Different submarkets are enjoying (or suffering) widely differential growth rates.

- The drug, machinery, and hardware sectors are experiencing strong growth rates.

- On the other hand, wholesalers in the food, petroleum, furniture, and most raw-material sectors, impacted largely by deflationary forces in

their respective markets, are suffering from poor or, in many cases, negative growth rates.

- Poor performance in these industries is hurting distributors as customers stretch out payables, purchase in smaller quantities, pressure distributors for better terms, and sometimes pay at only a fraction on the dollar or not at all.

The entire industry is beset by financial squeezes associated with:

- Low inflation and a resulting inability to raise prices or pass along costs.

- High real interest rates and their burden in carrying large inventories. The extent of the burden can be dramatic. Inventory can represent as much as 70% of the asset value of wholesale distributors. Inventory carrying costs sometimes reach 40% of distributor's expenses.

Some of the most important economic pressures facing the industry are summarized in Exhibit I-2.

These economic pressures have driven many wholesalers to specialize their market focuses so as to:

- Increase the turnover of (and hence the return on) any given inventory item

- Secure from suppliers the advantages of higher volume purchases

- Obtain longer purchase commitments from customers or commitments for larger quantities

As a result, all wholesalers have increased their attention to financial analysis and management. This attention should be reflected in vendors' product offerings.

EXHIBIT I-2

ECONOMIC ISSUES AFFECTING WHOLESALE DISTRIBUTION AND IMPLICATIONS FOR INFORMATION SERVICES SUPPLIERS

Distribution Industry Sector	Issues	Operational Implications
All Subcontractors	Continued Low Inflation Difficult to Pass on Costs	Profitability Lost Containment
Food, Petroleum, Furniture, Raw Materials	Actual Deflation Contraction Consolidation	Tightened Cash Receivables and Inventory Mgmt.
Drugs, Hardware, Apparel, Printing	Sectional Growth	Acquisition Analysis Capacity Planning Distribution
Electrical Goods, Machinery, Motor Vehicles	Foreign Competition in Source Industries	Product Line Expansion Increased Competition

The wholesale distribution industry is very splintered in terms of the size of the firms participating, as shown in Exhibit I-3.

Fewer than 2% of the firms in the industry generate almost 50% of the total sales. Their businesses typically span multiple sites, and they may even participate in multiple subsectors of the larger distribution business.

- One large southwest wholesale distributor with revenues approaching $200 million operates in 40 locations and addresses 10 distinct markets, including electrical equipment, industrial machinery, and robotics. It has recently added a division to address factory automation needs and is extending its services to include design and installation consulting for factory automation systems.

EXHIBIT I-3

REVENUE CONCENTRATION IN INDEPENDENT WHOLESALE DISTRIBUTION ESTABLISHMENTS

Annual Sales 1985 ($ Millions)	Number of Establishments	Percent of Establishments	Percent of Sales
<$5,000	298,000	88.6	27
$5 - $25,000	33,000	9.8	27
>$25,000	5,400	1.6	46

- Product and market diversification and geographic expansion will be important strategic activities for these firms over the next five years. Communications will be a leading application for these firms. They will need to integrate dispersed operations into single logical reporting and even operational units while extending services into customer premises with customer site inquiry and order entry terminals, design and engineering assistance, etc.

- A combination of factors—including declining hardware costs, link-ups with retail chains, and specialized requirements—have led many of these firms to install sophisticated information processing systems in-house, frequently replacing outside processing services.

- Large firms are the most active in pushing new information-processing technologies such as electronic data interchange (EDI), forward integration to include point-of-sale (POS) systems, automated warehouses, etc. These firms are the principal markets for applications software sales for mainframe and minicomputer systems.

At the other end of the spectrum, some 300,000 firms (87% of the industry's business units) earn less than $500 million a year in revenue, contributing only 27% of the industry's total sales. Most carry only very specialized lines and serve only local urban markets. This stratum will experience substantial consolidation in the next five years as the firms are unable to match larger wholesalers in such competitive areas as price, selection, delivery, value-added support services, purchase terms, etc.

Many undercapitalized firms are now falling victim to softness in their customers' industries and the resultant stretch-out in receivables. One survey by a national distributor's association indicated that 30% of these firms had received acquisition offers within the past year.

- Many of these "Mom and Pop" distributors have implemented only the most primitive automation or information systems.

  - These smaller firms are the largest buying segment in the wholesale distribution industry of microcomputer software and micro-based turnkey systems. They will continue to purchase large numbers of such systems over the next five years.

  - However, given the relatively low and declining prices and resultant pressures on profit margins from the sale of such systems, vendors should look at distribution strategies that either sell and install through existing sales and support networks or that involve third-party value-added resellers (VARs).

Between these two extremes of company types are 30,000 wholesale distributors earning between $5 and $25 million per year. These companies are more likely than their smaller counterparts to possess the diversification and the financial and management wherewithal to survive contractions in customer industries and competitive pressures in their own industries.

- Aggressive computerization is forecast for this stratum as companies automate warehouse operations, order processing, inventory management, purchasing, receivables collections, and sales tracking and forecasting.

- Automation is less a strategic thrust for these companies than it is a matter of survival in meeting the cost and competitive pressures in the environment. Medium-sized firms form the backbone of the aggressive growth forecasts in turnkey systems sales, systems typically based on business-oriented minicomputers such as IBM's System 34/36/38.

Wholesale distributors are being confronted by a dizzying array of new technologies and applications, all of which hold the potential for assisting in cost containment, service-level maintenance or enhancement, and strengthening of competitive position.

Among the most important computer and communications technologies emerging in this industry are:

- Point of sale (POS) and the forward integration of data collection into retain channels.

- Electronic data interchange (EDI), now aimed at reducing labor costs associated with copious data entry and re-entry requirements of order processing. Soon EDI will be extended to support automatic payment transfers among suppliers, wholesalers, and retailers.

- Software integration to make data collected from one part of the business available to aid analysis and reporting in others. Examples include:

  - Inventory stock status being available to customers for inquiry

  - Sales data being used to develop profiles for targeting new markets or customers

  - Communications, typically between dispersed offices or warehouses or between customer sites and warehouses

  - Expert systems

Exhibit I-4 summarizes some of these technological issues and the challenges they pose to IS departments and vendor sales.

EXHIBIT I-4

TECHNOLOGICAL ISSUES AFFECTING WHOLESALE DISTRIBUTION

Technology	Rationale	Challenges
POS	Data Capture Leads to: - Customer Analysis - Sales Modeling/ Forecasting	Forward Integration of Data Collection How Much Data to Capture, Analyze
EDI	Cost Reduction in Order Processing	Software Communications Standards
Software Integration	More-Efficient Use of Data	Tower of Babel Syndrome Resources
Expert Systems	Inventory Cost Minimization Delivery Optimization	Cost of Implementation Least-Computerized Industry Function

C
Application Analysis

The classic "bedrock essential" applications of the wholesale industry include inventory management, purchasing, order processing, accounts receivable, accounts payable, expense reporting, and sales forecasting. These functions are usually offered on even the smallest systems, including PCs.

As wholesalers grow in size, their applications requirements evolve to focus less on transaction-based processing and more on management reporting applications. This is especially true as firms expand to new markets and product lines, as the number and stocks of inventoried items increase, and as pressures grow to boost financial performance through improved inventory management.

- At the high end, the most sophisticated wholesalers are implementing programs to dynamically model inventory stocks; economic order quantities (EOQ); customer, product line, and market profitability; and delivery routing. Exhibit I-5 displays this evolution toward higher-value-added applications as users' size and sophistication increases.

Some of the applications cited by users as among the most important for them over the next two to five years are discussed below.

1. Electronic Data Interchange

Electronic data interchange (EDI) poses one of the most far-reaching challenges to the wholesale distribution industry of any existing technology.

Its implementation to date has been retarded by several factors, such as:

- The fractured nature of the industry with many small, independent wholesalers
- The lack of system software and communication standards (though use of the ANSI X12 standard is emerging in this area)
- The unwillingness or inability of many participants to devote the resources necessary to implement EDI

Several factors indicate that EDI is emerging in a major way.

- The potential for cost reduction is enormous simply through reducing labor requirements for data re-entry and thereby eliminating errors caused by rekeying. Users have estimated potential cost reduction in these areas of as much as 70%.

EXHIBIT I-5

EVOLUTION TOWARD HIGHER-VALUE-ADDED APPLICATIONS IN THE WHOLESALE DISTRIBUTION INDUSTRY

- Definition, implementation, and enforcement of a standard would be a major strategic advantage for a large manufacturer, wholesaler, or chain that was able to gain early adherence, participants, and momentum.

  - The reservation systems of United and American airlines pose analogous cases. They have proven of enormous strategic value to both companies.

  - ATM networks in banking have also been used to similar effect.

Overall, EDI applications will grow from a small base at an average annual rate of over 56% for each of the next five years.

2. Distribution Resource Planning

Distribution resource planning (DRP) grew out of manufacturing resource planning technologies in the late 1970s.

DRP programs automate purchasing, storage, and retrieval and utilize sales forecasts to determine the size and frequency of inventory replenishments.

- DRP is used by warehouse personnel to prevent inventory stock-outs and overages and to minimize inventory. DRP is used by finance to predict cash flow requirements and perform margin analyses by product lines or products. DRP is used by marketing to streamline customer deliveries and plan product promotions, introductions, etc.

- DRP can serve as a "cradle-to-grave" tracking system for monitoring parts flows from manufacturers to the retail shelf.

Users are experimenting with rule-driven programs resembling expert systems. These programs predict optimum reorder times and quantities and take advantage of discounts for volume purchases, prompt payments, etc.

Such systems reduce warehousing, inventory carrying, and transportation costs, the major cost components for this industry.

3. Distribution Network Management

Distribution network management is an application originally developed within the transportation industry to optimize the costs of delivering diverse types of freight to many locations over several possible modes.

- DNP grew out of linear programming concepts and originally required large hardware, software, and staff commitments.

Recently, it has been married to DRP to add a transportation component to overall operating costs planning and analysis.

DNP is winning increasing acceptance in the wholesale distribution industry for modeling such variables as:

- Delivery routes and alternatives
- Fleet and equipment requirements
- Cargoes
- Delivery frequencies
- Multilocation inventory stocks
- Backhaul opportunities
- Freight budgets

Some users have reported increases in vehicle fill rates of as much as 50%.

Applications are being interfaced to fleet maintenance programs that perform vehicle repair frequency evaluation, cost analysis, and equipment amortization scheduling.

The objectives are financial analyses and operations models aimed at increasing services (e.g., delivery frequency) while reducing costs (e.g., delivery, inventory holding).

4. Others

Users noted several other important applications, which they intended to begin implementing over the next two years:

- Dynamic inventory modeling
- Bar code reading
- Sales forecasting
- Telemarketing
- Point of sale
- Communications

D
Driving Forces

The driving forces listed in Exhibit I-6 directly affected the use of information technology in wholesale distribution.

Pressure on profit margins that are low to begin with (2-3%) has made bottom-line return the foremost driving force in the industry.

- This force has driven wholesale distributors of all sizes to focus on computing as a means of reducing the costs of managing inventories, entering and processing orders, and associated accounting and administration.

EXHIBIT I-6

WHOLESALE DISTRIBUTION DRIVING FORCES

- Bottom-Line Return
- Rapid Response and Deployment
- Expanding Wealth of Powerful Technology
- International Competition
- Unstable Organizational Environment

- Small wholesalers are driven to find some means of automating their businesses, even if the means is software from a retail computer store customized for a PC compatible.

- Larger firms are driven to seek and promote developments in technology that can reduce costs for orders, payments, and scheduling inventory activity. Examples are EDI, automated warehouses, use of POS data, and Distribution Network Management.

A second driving force for wholesalers is the need to rapidly respond to and deploy capabilities to meet customer needs. When a wholesale distributor handling hardware, piece goods, or groceries finds that its problems can be solved through computerization, it wants to have a turnkey or application software capability rapidly deployed to solve the problem.

The expanding wealth of powerful technology constitutes a driving force in the wholesale industry as well.

- The advances made by Digital Equipment in OLTP software (the InTact package) and by IBM with the AS/400 OLTP systems were of immediate interest to wholesale distributors and led to a number of orders.

- New network capabilities for EDI offered by GEIS, McDonnell Douglas, and ADP will influence the plans of wholesalers.

Current international competition can result in contraction or expansion in business for domestic manufacturers or foreign manufacturers located

in the United States. This driving force can have an impact on the use of computing by wholesale distributors, who have to be prepared to rapidly expand computerized service to new plants or to modify computerized procedures to accommodate new customer requirements.

Since wholesale distributors are intensely concerned with increasing revenues and lowering costs, end users, subsidiaries, and top management are highly concerned about computerization and advances in computer technology. Management is likely to initiate or respond to contacts from vendors, and even to initiate steps to acquire IS products or services, without consulting central IS management. Mergers between wholesale firms that are trying to increase volume or expand narrow products lines add to the problem of coordinating IS planning. The resulting unstable organizational environment is a driving force that affects the use of information services.

One IS executive of a nondurable-goods distributor commented to INPUT that he had to support and correct distributed data on PCs that he never planned or ordered as well as take a back seat to any success of end users in using the data. This made it necessary for the IS executive to battle for an upgrade in data base capabilities.

A number of vendors have responded to this situation by not only developing strategies for using contacts with end users or subsidiaries to open doors at prospects, but also by building bridges to support IS management to the extent necessary to develop an approach toward the use of information technology that will aid future business.

E

Major Issues and Inhibiting Factors for Vendors

Based on information gathered from wholesale distributors and vendors serving this market, six major issues facing vendors were identified. These issues are listed in Exhibit I-7.

Each of these issues requires consideration and planning in terms of market objectives required for success.

- The first issue for vendors to consider is the requirement for or emphasis on payoff that is particularly intense in this sector.
  - Independent wholesale distributors, particularly mid-sized and small ones that are driven by bottom-line performance and competition, generally demand more than a turnkey or application package that addresses their functional needs (order entry, customer service, inventory, billing, and accounting). They want solutions that have been developed or customized for and proven in their market or submarket, size range, and geographic location. A representative of Verticomp notes the above and feels that independent wholesale distributors require more differentiation of service than most indus-

tries. Imrex and Distribution Management Systems of North Carolina meet this need by emphasizing an ability to customize integrated applications to meet user needs.

EXHIBIT I-7

ISSUES FOR INFORMATION SERVICE VENDORS

- Payoff
- Integration
- Data Management
- User Involvement
- Connectivity
- Direction

- Large, independent wholesalers that are looking for means of improving bottom-line performance through advances in information technology are equally anxious to confirm that new technology, such as EDI, has been proven in similar situations to their own.

- In order to be successful in this market, vendors must work closely with their accounts and gain knowledge and experience to use with other prospects. One of the problems mentioned by wholesalers in relation to vendors is insufficient follow-up to tune applications.

- The amount of time required to support certain accounts can be an inhibiting factor in this sector.

• The second major issue for vendors is integration. Wholesale distribution's focus on solving problems and obtaining a payoff has led to a number of computing installations that were implemented rapidly to meet one or two needs. Other applications were added later.

- Many wholesalers have become aware of the extra costs and work that has been entailed in growing in this piecemeal fashion. Many wholesalers have been forced to combine data from several systems to examine profitability or to re-enter data from one application to another. They have also encountered limitations and problems resulting from multivendor equipment solutions.

- The absence of integrated applications has also made it more difficult to manage data and support forecasting and planning applications according to some wholesalers.

- According to a number of vendors, even vendors of PC-based software for wholesalers are now finding that successful marketing objectives require offering modules that can be developed into integrated systems or to explain to buyers how they might integrate the package with other available software.

• User involvement is a complex issue for information service vendors serving the wholesale distribution market. Except for very small firms, users exhibit the end user activity found in many industries.

- End users are using PCs and 4GLs to address functional needs.

- End users make contracts with vendors for products and services and are quite adamant when opposed by IS management if they feel they can improve bottom-line performance.

- End users are impatient with delays or difficulties of IS management in meeting their needs.

- Users may also be developing applications that are not fully described or reported to IS.

• Management now acts as a user as well as an executive at many wholesale distributors and will join with major functional users to give directions or demands to IS management.

• Data management is becoming an issue of increasing importance to vendors serving mid-sized and larger wholesale distributors. Since many vendors have provided solutions on a piecemeal basis to solve ordering, customer service, inventory control, billing or other problems, they have been involved in increasing the number of physically distributed sets of data.

- Resulting data integrity problems have created industry awareness of the need for data management.

- Difficulties in converting from one application system to another have resulted from data management problems as well, and this has led some vendors such as Harris Data and Distribution Management Services of North Carolina to develop expertise in conversion services.

• Wholesalers are turning more often to vendors for aid with data management. Oracle is selling its DBMS and consulting services to whole-

salers. Teradata has had significant success with its hardware-based relational data management architecture in this sector. Several CASE vendors have sold data resource consulting to wholesalers.

- In the future, vendors must be prepared to consider the support of a relational data management system to meet user needs or to participate in user assignments that involve the implementation of a data dictionary to be successful in this market.

- Connectivity is a major issue for many vendors providing services to this sector. Vendor turnkey products or application software probably will have to receive or transmit data to other sites (many wholesale distributors have physically separate offices) to computers at a customer's site, or to manufacturer or supplier sites.

- Vendors must consider the future communication needs of customers in their submarkets and what type of support will increase opportunities. This could include just supporting the connectivity that will be required in the marketplace or becoming proactive and using connectivity as a strategy for penetrating new accounts with distribution problems (as DEC is now doing). A lack of communications capability or knowledge will be an inhibiting factor in this marketplace.

- A critical major issue for many vendors in the wholesale distribution marketplace is determining what direction their business should take.

- Many vendors specializing in software or turnkeys for a submarket such as food or industrial parts—or vendors who have become experts in inventory or order processing for a narrow set of submarkets—seem to be using all their resources to extend their functional knowledge and become more specialized at the expense of growth.

  - The marginal return of some product enhancements or new features is relatively low, according to some vendors.

  - There should be other submarkets where this specialized knowledge could be used. If vendors do not have the funds or sales offices to take advantage of opportunities, they might consider alliances with software or hardware vendors to introduce products.

- Even if the knowledge of vendors increases their value within a submarket, business could be lost to competitors who had increased their technical capabilities and could offer benefits such as lower-cost solutions, faster order entry, or software to provide links to EDI networks. Some vendors have added EDI-enabling software to strengthen their product offerings.

- Large vendors such as IBM and McDonnell Douglas, which have applications for submarkets in wholesale distribution, are well equipped to implement technological advances when needed.
- Smaller vendors with a narrow focus in wholesale distribution must formulate objectives for growth, use of technology, and alliances that will provide growth opportunities and directions for the firm, as well as protection against competitors.
- In this market sector, the narrow margins of prospects of all sizes can be an inhibiting factor in planning to obtain vendor services.

F

Major Issues for Information Systems (IS) Managers

Based on information from companies engaged in wholesale distribution and from vendors serving this market sector, the five major issues affecting the IS departments in the industry, listed in Exhibit I-8, were identified. The factors involved with each of these issues, and objectives that vendors should consider, are analyzed in this section.

EXHIBIT I-8

ISSUES FOR IS DEPARTMENTS

- Rising Management Expectations
- User Demand for Complexity
- Managing Technical Investment
- Integration of Data and Applications
- Productivity/Backlog

- The first major issue to consider is rising management expectations. Management in this industrial sector expects the use of information technology to bring relief from bottom-line pressures, provide the means of meeting competition, and facilitate expansion.
  - Company management in wholesale firms associates its expectations with the contribution that IS should make to the firm.
  - These expectations are held despite the backlog of applications with which IS is struggling.

- IS must attempt to ascertain which objectives are most critical and whether management will allow external resources to be used.

- IS should also attempt to educate management about the steps necessary to achieve management expectations and attempt to establish a committee composed of management, IS, and key users to develop a statement of direction and specific steps.

- Vendors should address this situation by developing presentations that can bring users, IS, and management from a prospective buyer together to discuss needs in the submarket based on their experiences, and the technology and applications that are necessary to achieve management expectations.

- User demands for complexity is the second major issue confronting IS management. End users not only continue to want new workstations and 4GLs to handle planning, but they are anxious to upgrade applications, obtain more external and internal data, and utilize new technology.

  - IS management in a large energy and chemical conglomerate commented that users concerned with chemical distribution want to map out a strategy to achieve segmented applications whereby after running analytic jobs on their workstations they could feed data to processing runs on a mainframe handling resource planning. This IS group is reviewing vendor contacts to locate expertise that can be used to address this user need.

  - Users in a number of large and mid-sized distribution operations are reviewing how their firms can move to OLTP. The AS/400 seminars of IBM on distribution and a number of recent Digital Equipment advertisements have addressed the interest in OLTP by users in distribution firms.

  - Several vendors involved with software engineering noted that end users in firms with distribution problems were interested in research and new developments in relation to data resources (e.g., entity data relations, resource dictionaries).

- IS confronts a major issue called management of technical investment. The pressure of bottom-line profitability and of meeting competition can lead IS management to consider limited or short-term steps to install an application, interface new applications, or provide access to data. Any step that is taken should not be in conflict with plans for hardware and software architecture, an evolving network, or the establishment of a corporate data resource.

- Users will ultimately take more responsibility for applications, but users and management will expect the investment in technology to be principally the responsibility of the IS executive.

- IS will be expected to provide warnings and corrective actions when management or users cause expedient steps to be taken.

- An IS contact at an energy company noted how quickly a new mini-based system was implemented to solve a distribution problem at a subsidiary and then replaced with a package on a different computer. He felt that the original vendor had not considered steps in connectivity or plans for data consolidation that would have allowed the original installation to remain in place.

• Integration of data and applications is one of the recognized issues for IS management in wholesale distribution. Integrated applications and data provide a means of establishing a competitive edge since the ability to provide accurate information about products and to place an order rapidly require integration of order entry, inventory management, and accounting. If the product data base is not kept up to date for every order, this integration cannot be achieved. Accounting information about customers must also be integrated with ordering systems so that orders are not accepted or shipped in certain circumstances. The functions of the business of a wholesaler are tightly knit together and should be handled together, as noted by Distribution Management Systems of Connecticut, which specializes in the food industry.

• In this environment, applications and data will rapidly become integrated and IS management must continually think of integrating possible future applications that will provide product information to customers, prepare customized bills based on combinations of orders over time, or handle on-line transactions from customers. If applications and the data they use are not integrated, most new applications will require rewriting of a number of existing applications and will be costly and time-consuming to deliver.

• Productivity is an issue of concern to IS management since users and management of wholesale distribution organizations are prone to initiate action or respond to vendors if work is delayed. IS must become knowledgeable of vendor solutions due to this circumstance and be prepared to rapidly evaluate them.

G
Major Issues for End Users

Based on an assessment of wholesale distributors and vendors serving this market, the major issues facing end users, listed in Exhibit I-9, were identified.

EXHIBIT I-9

ISSUES FOR END USERS

- Role in Systems Development
- Observance of Standards
- Integration
- Connectivity
- Data Management

Vendors should consider and plan their objectives for success in this sector based on the impact of these issues.

The first major issue facing end users is their role in systems development.

- End users have played a major role in acquiring applications packages, equipment, turnkey systems and the assistance of professional service firms with skills in wholesale distribution.
- End users have directed projects in their functional areas and provided systems work on requirements and analysis. End users have also handled maintenance, some development programming, and operations.
- In some instances, end users have developed applications with their own personnel.

End users expect to have a role in projects involving their functional areas and are concerned about who will handle the development activity.

End users will assume more responsibility for application development in their areas and will call upon IS for advice and technical support.

Vendors must develop objectives for marketing that recognize the end user trend, but that can be adapted to specific situations. In some cases, IS will focus on technological issues and let users discuss functional issues. In other cases, IS management will lead the discussions of application needs. Several vendors note that even when IS takes the latter role, vendors should sell their application strengths and overcome objections of both IS and end users.

Due to their expanding role in system development, end users now face a major issue in the observance of standards. End users have not always been concerned about the languages, equipment, data structure, communications standards, development methodology, or presentation formats for application solutions they acquired or promoted for company use.

In a number of situations, it has been difficult to integrate the resulting applications or to pass data between end users or between the end user and central IS installations. End users have found themselves hampered by delays that are the result of past decisions.

As a result of this situation, end users will consult IS with greater frequency regarding standards.

Today, end users may become highly interested in a vendor product due to its functional capabilities and then display less interest after they review standards.

Vendors must assess the use of standards and potential problems with prospects before this issue arises.

- Objections to vendor products based on conflicting standards should be anticipated to increase possibilities for success.

- A vendor solution that is incompatible with other applications may still be employed if connectivity with other systems can be demonstrated.

End users are now finding that they face a major issue in integration. The applications they have installed in their own areas, such as order entry or inventory management, must now be integrated with each other or with accounting, customer service, or other functions.

- In some cases, it will be necessary to replace separate software applications with an integrated set of modules.

- Considerable effort may be required to integrate existing applications after they have been installed.

End users must consider needs for future integration—both within their areas and with other offices—before installing new applications under pressure. This could require consultation with other firms in their industry or with vendors.

Vendors should consider providing brochures, education, and demonstrations to illustrate not only how their modules are integrated, but also to educate prospects on their need for integration in the future.

End users also face major issues in terms of connectivity. They need to obtain data from, or supply data to, each other and to central systems. Some users are interested in communicating with customers and suppliers or manufacturers.

End users must ensure that IS products they obtain or systems they develop do not limit their ability to communicate.

- The wholesale distribution business requires communications to aid rapid response to queries and orders, information about supplies or future needs, and rapid billing and follow-up to accounting problems.

- Improvements in bottom-line performance depend on new developments, such as EDI, that require communication capabilities.

Vendors must stay aware of communication developments that might have an impact in their submarkets. Touch-tone input has been used by IBM, voice response by Periphonics, and OLTP by IBM, Digital Equipment, and Ultimate to gain business in wholesale distribution.

End users have found that data management is a major issue for them as well as for IS. They must integrate information about customers so that their history of product usage, customer service data, and accounting records, including payment patterns, are available to analyze profitability or opportunities for expanded services. This requires that data from several functional areas be available, current, and accurate.

- End users, particularly in larger wholesale distribution operations, want data management capabilities available that will handle all necessary data and organize data in the form necessary. This requires a relational data management capability as well as a data administration function.

- Many smaller wholesalers have attempted to gain this capability through use of certain turnkeys or software that combined application and data management capabilities.

In addressing data management issues, end users must rely upon IS for aid with information technology.

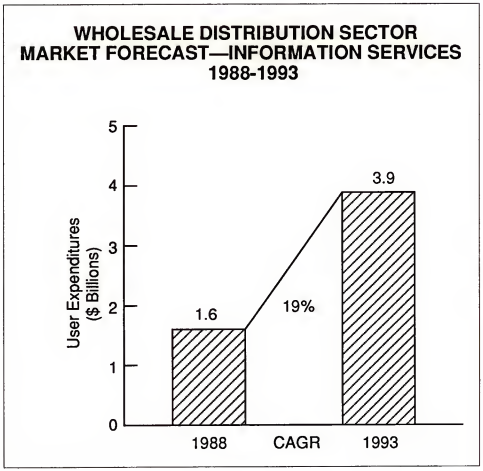
If possible or appropriate, vendors should address the data management issue by marketing a total solution, including a data base capability. The DBMS should be relational in view of the needs of this market sector, and if possible, should support solutions on workstations as well as minis.

II

Wholesale Distribution Forecast

Total information services user expenditures in the wholesale distribution sector will reach $1.8 billion in 1988 as shown in Exhibit II-1. This will include expenditures for processing services, application software, and turnkey systems, as well as expenditures for network services, professional services, and systems integration. The latter three were not previously analyzed in relation to the wholesale market.

EXHIBIT II-1



The compound annual growth rate (CAGR) from the comparable 1987 figure for total services ($1.6 billion) is 19%, which is slightly above the industry average, reflecting the increase of IS activity in wholesale distribution in 1988.

Between 1988 and 1993, user expenditures will grow at an CAGR of 19%, to a level of $3.9 billion, as shown in Exhibit II-1. More details on this growth are shown in Exhibits II-2 and II-3 and Appendix B.

EXHIBIT II-2

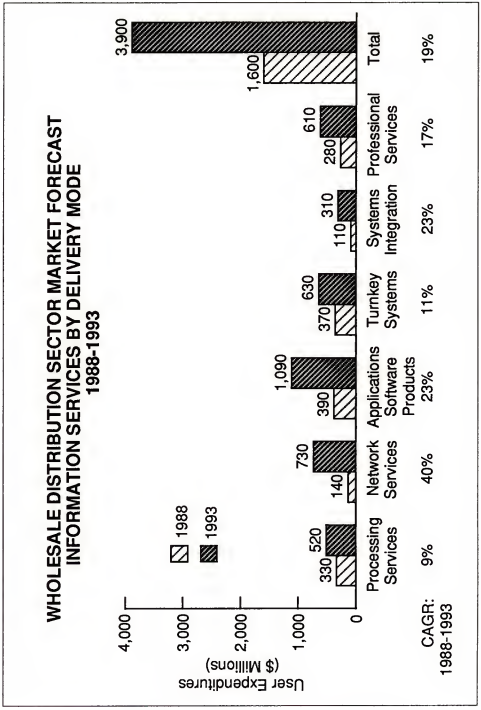
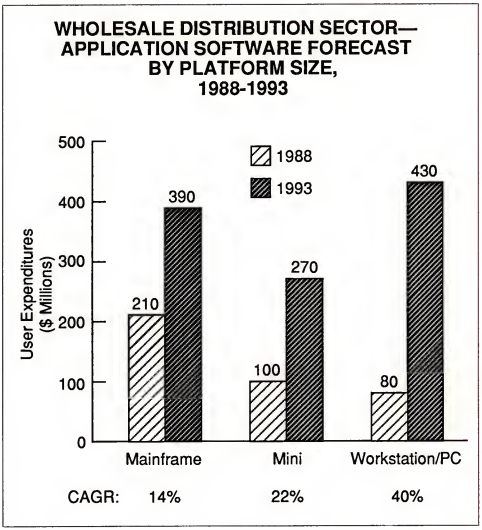


EXHIBIT II-3



Size and growth forecasts for this sector from 1988-1993, presented in Exhibit I-2, indicate differences in the size and growth rates of delivery modes.

Software and turnkey products will continue to be the largest delivery modes over this period of time, since wholesalers with problems tend to look for rapidly available software and turnkey application solutions for their submarkets.

Expenditures for PC/workstation software will grow at a rapid 40% rate, reflecting the trend toward shipments of smaller systems into this sector. Although minicomputer shipments in general have a declining growth rate, their placement in retail chains, with associated software, still remains strong.

Expenditures for professional services will grow at a CAGR of 17%, reaching an expenditure level of $600 million, and systems integration will grow at a CAGR of 23% to a level of $300 million, as more professional service vendors begin to take advantage of their knowledge of new technology in wholesale submarkets.

- Several vendors noted that knowledge of a wholesale area, together with knowledge of how to introduce new technology, provided significant opportunities.

- Growing backlogs and pressure to implement more-complex applications that can improve bottom-line performance in a short time will motivate wholesalers to make greater use of professional services and systems integration.

Processing services will grow less rapidly (9%), to a level of $520 million in 1993, since users, driven by pressures to reduce costs, are taking advantage of opportunities to use turnkey systems or application software packages to reduce processing costs.

- Transaction processing services will be a substantially larger component of processing services (82%) in this sector, amounting to $270 million in 1988 and growing at an CAGR of 9% to $420 million in 1993. Cost pressures in this sector tend to encourage IS or users to take over operation of work in-house.

- Systems operation services will grow at a slightly higher CAGR of 11%, to $100 million in 1993.

The use of network services will increase from a relatively low base, at a CAGR of 40% as wholesalers make more use of EDI or electronic information about their submarket or products of interest.

III

Competitive Developments

A

Market Characteristics

A large number of information service vendors serve this marketplace. Over 150 software and turnkey vendors can be identified. Application software is the dominant service mode in this sector.

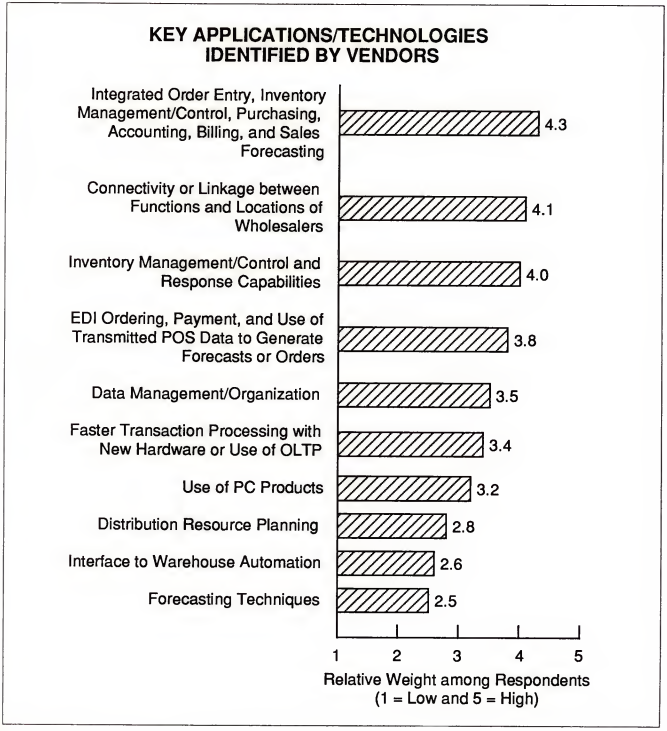
- Many of the vendors are small, specializing in submarkets such as food, lumber, or wine/spirits.
- There are also large IS vendors (including IBM, McDonnell Douglas, Unisys, and Hewlett Packard) with applications in wholesale submarkets.
- Older application approaches—including batch processing, unintegrated applications, and paper-intense systems—are still in operation, although the use of recent technology—including EDI networks, OLTP, voice response, CD ROM, Touch-Tone, hand terminal input, and relational data base systems—is expanding.
- Market share by leading vendors accounts for only 17% of the total market. This is a very fragmented market, with many smaller vendors serving local subsegments.

Competition is keen in this sector, with some vendors using their knowledge of a sector as a key weapon and other vendors attempting to use information technology as their key weapon to penetrate accounts. Digital Equipment, for instance, is emphasizing connectivity and OLTP in advertisements about its installations in wholesale distribution. Harris Data Systems and Global Turnkey, as well as other vendors, feel that knowledge of submarkets is required to maintain and grow revenue, however.

Vendors that have relied chiefly on application knowledge have been or will be forced to consider technological advances as firms in the sector demand upgraded automation.

Key applications/technology identified by vendors with wholesale distribution revenue are listed in Exhibit III-1. Integration of software remains a major market thrust, although inventory management control and the use of technology were frequently noted.

EXHIBIT III-1



- Vendors gave the greatest weight of their responses to integration of order entry, accounting, inventory control, billing, and/or other software as a key application. This weight reflects the concern in this sector about serving clients rapidly and measuring bottom-line performance accurately. Many vendors have plans to modify or upgrade software to achieve more functional capabilities, together with integration of applications. One need that was stressed was the ability to obtain more complete or better management information to measure or improve performance or service. These needs were mentioned by a variety of firms serving both durable and nondurable-goods wholesalers.

- Connectivity is of key interest as well, since communication between local and remote organizational units, warehouses, suppliers, and customers is essential to business. One vendor serving a major wholesaler noted that PCs were being used to tie together operations with different computing systems rather than change software in large application systems. The PCs could edit, validate, and reformat data that had to flow between systems.

- The ability to manage and control inventory, particularly inventories of durable goods, was stressed by many vendors. Vendors such as DMS of North Carolina feel that this ability is the most significant problem it is solving for customers.

- EDI was ranked high by a number of vendors who commented that some wholesalers have been ordered to support EDI systems by large manufacturers such as GM and DuPont. Vendors as well as wholesalers show interest not only in the ability to receive and place orders and receive payment through EDI, but also in the standardization in ordering, billing, and payment.

- Vendors also noted the benefits from obtaining sales data from customer sites.

- Faster transaction handling or OLTP was ranked highly by some respondents due to the concern of wholesalers in supplying customers with faster service or countering the offerings of competitors.

- The management of data was also mentioned as a key technology by some vendors. Some firms think of data management principally in relation to the integration of functions and software. Other firms are interested in it to rapidly measure or analyze performance. Interest in relational data bases is increasing as a result, although some vendors serving smaller distributors are concerned about throughput if a decision is made to utilize relational data management.

- The use of PCs was mentioned by vendors in general as a key technology. Several noted that they expected PCs and workstations to provide more economic alternatives for distributed applications in accounting offices or warehouses.

- Some vendors noted that smaller independent wholesalers are now using integrated systems that operate on PCs equipped with large disk storage devices and that large distributors are using PCs to run models for purposes such as analyzing and forecasting needs or optimizing the use of warehouses.

- The use of Decision Resource Planning or other software application techniques—including expert or rule-based systems to aid with inventory management—was noted as a key application by vendors. This type of application is used to guard against inventory stock-outs as well as to prevent overages. These applications could be used by manufacturers working together with wholesalers to predict optimum reorder times and quantities, and to generate orders automatically to the order entry systems of wholesalers.

- Forecasting techniques were also mentioned by vendors in relation to inventory problems. Specialized forecasting software and decision support are being developed by vendors for users with PCs and workstations.

- Software to support new warehouse automation, hand-held terminals, and bar coding were also mentioned by vendors, reinforcing the concern with inventory movement and control in this sector.

Leading and emerging vendors in wholesale distribution in 1987 included IBM, CACI, Triad, Imrex, NDC, CSC, and System Software Associates, as shown in Exhibit III-2.

- IBM, CSC, and NDC, which have been leading vendors in this sector over a period of time, receive only a small portion of their revenue from wholesalers.

- IBM maintained a pre-eminent position through its software packages, which address sectorwide needs such as order entry and accounting, as well as the needs of multiple submarkets, including hard goods, welding, and concrete wholesalers.

- CSC, which has maintained a leading position in wholesale distribution through professional services for all sector submarkets, has discontinued its processing services and software products for the wholesale market. NDC's processing services are also marketed across multiple submarkets.

EXHIBIT III-2

WHOLESALE DISTRIBUTION SECTOR— INFORMATION SERVICES SELECTED VENDOR MARKET SHARES, 1987

Vendor Name	Revenue ($ Millions)					
	Processing Services	Turnkey Systems	Application Software Products	Systems Integration	Professional Services	Total Market
IBM	-	-	50	-	-	50
CACI	-	-	-	-	25	25
Triad	-	17	-	-	8	25
Xerox	20	-	-	-	-	20
ADP	20	-	-	-	-	20
MSA	-	-	15	-	-	15
Imrex	-	-	12	-	-	12
NDC	10	-	-	-	-	10
Arthur Andersen	-	-	10	-	-	10
CSC	-	-	-	10	-	10
System Software Associates	-	-	10	-	-	10
GEISCO	8	-	-	-	-	8
CD Systems	-	-	-	5	-	5
MCBA	-	-	5	-	-	5
Cornell (CP Int'l)	-	-	-	-	5	5
Global Turnkey	-	5	-	-	-	5
American Software	-	-	5	-	-	5
Harris Data	-	4	-	-	-	4
Total for Leading Vendors						244

- Triad, Imrex, System Software Associates, and a number of other fast-growing vendors have a much higher share of revenue devoted to the sector or submarkets in it. Sales management at these firms and at Harris Data and Global Turnkey noted that more concentration on the needs of submarkets is required for success today.

- Imrex is one of the few vendors that are more dedicated to wholesalers and that service a wide range of wholesale submarkets, including durable and nondurable goods.

- Triad, one of the leading vendors in the sector, markets turnkey systems to wholesale markets, including automotive parts, and two retail markets. Global Turnkey also serves both retail and wholesale submarkets, including building materials and electrical goods.

- The more common split of target markets is between manufacturing and wholesale distribution. The vendor can provide application systems that either serve the applications independently or manufacturers with distribution functions. System Software Associates, one of the other leading vendors in this sector, serves either or both applications, as does Imrex, American Software, and a number of large and small application software vendors.

- The intense concern of wholesalers about bottom-line performance and accounting has resulted in the development of a base of strength in accounting, particularly integrated accounting software, in firms that serve this sector. Harris Data, Imrex, and System Software Associates exemplify this trend.

- A group of other vendors—such as M.S.A. and GEIS—also have a presence in wholesale distribution due to strength in accounting or special applications such as EDI or DRP. In addition to software for wholesalers, M.S.A. has added EDI interfaces to its comprehensive accounting software. These interfaces are used in wholesale distribution and many other fields. GEIS's expanding EDI network serves firms in the wholesale sector as well.

There was not much consolidation or acquisition of firms in the wholesale distribution sector in 1987, except for smaller transactions (such as the acquisition of Cornell) which did not change service in this sector. The tendency in this sector is for firms to move into new submarkets, as Harris, Global Turnkey, or Imrex have done, or to offer new modes of services in existing markets, as Triad has done by offering electronic information to automotive parts distributors.

B
Vendor Profiles

1. American Software, Atlanta, GA

a. Products/Services

- An integrated line of application software products that are used on mainframe and IBM S/38 computers in the areas of wholesale distribution, manufacturing, utilities, and other industries. Software used in the wholesale industry includes demand forecasting, inventory planning, distribution requirements planning, inventory deployment, order processing, purchasing, inventory control, accounting, and vehicle scheduling.
- Professional services that aid customers to integrate their products and files with the products of American Software
- Software to support PC interfaces to the mainframe DRP system

b. Strategies

- Provides a very high level of application software capability in general areas such as inventory and distribution requirements planning. The inventory planning program allows clients to simulate and model the flow of stock.
- Targets the needs of larger companies with complex inventory and distribution problems and customizes solutions when needed.
- Offers a preconfigured set of software for mid-sized companies or divisions of large companies in the $25 to $50 million range.

c. Recent Activities

- Achieving a high level of success with a system-handling forecasting and logistics planning that is aimed at wholesalers, manufacturers, public utilities, and large retailers.
- Continued work on PC-based productivity tools for the end user.

d. Future Plans

- Continue present thrust in support of general inventory management, purchasing and materials control, and products for midrange customers and end users.

2. CSC, Los Angeles, CA

a. Products/Services

- Professional and network services are sold to wholesalers.
- Has extensive network capabilities.
- Has experience and knowledge of software for wholesalers.

b. Strategies

- Relies on experience with service and software for distribution market and knowledge of technology needed for sector.

c. Recent Activities

- Expansion of network service sales

d. Future Directions

- Plans to market large-scale network services to wholesalers

3. CACI, Arlington, VA

a. Products/Services

- Professional services to inventory management and warehousing components of wholesale operations

b. Strategies

- Utilize, in the commercial sector, the experience gained in distribution applications for federal government contracts, particularly in logistics, warehousing, and materials management.

- To sell and perform business in the commercial sector, utilize the knowledge and marketing expertise of CACI in selling professional services to the federal government.

c. Recent Activities

- Contacting very large wholesale distribution operations to inform them of CACI's experience

d. Future Direction

- Expanding capabilities into other commercial inventory management/ control areas

4. Distribution Management Services, Milford, CT

a. Products/Services

- Integrated wholesale system for the food industry implemented on DEC VAX equipment
- Professional services to customize product

b. Strategies

- Use in-depth knowledge of food industry and reputation to gain sales.
- Customize software to tailor system to client needs.
- Exploit automatic purchasing software, which is one of the key needs of the food industry.

c. Recent Activities

- Upgrade of DEC capabilities

d. Future Directions

- Maintain lead in functional knowledge of wholesale needs in the food industry.

5. Distribution Management Systems (DMS), Rocky Mount, NC

a. Products/Services

- Integrated distribution systems (order entry, inventory management, and accounting) for use on IBM S/36 or AS/400 computers. Will deliver software alone or turnkey systems.
- Systems are targeted primarily for the automotive industry but will handle other discrete products for electronics, heating, and air-conditioning distributors, and some retail applications, such as gift stores.
- Will utilize POS or other order entry devices at wholesalers or retail customers.
- PC distribution system (for the IBM PC XT, AT, or compatible computers) that offers full distribution functionality, including work orders, back orders, and pick tickets as well as spoken messages. PC systems have been sold to retail stores and wholesalers.

b. Strategies

- Exploit knowledge of inventory management and control and ability to generate data bases to attract prospects.
- Provide service to clients that will generate sales through references and reputation. Service includes installing system, helping clients to use it, providing software maintenance, and helping customers obtain hardware service from IBM
- Provide customization economically by modifying control records (adjusting parameters)
- Use telemarketing to supplement reference sales

c. Recent Activities

- Preparing to offer software on AS/400
- Adding technological capabilities to support PC products and aid clients with connectivity needs

d. Future Directions

- Expand sales to more markets that involve discrete items

6. Global Turnkey, Denville, NJ

a. Products/Services

- Wholesale distribution system implemented on Data General equipment that has been customized for several wholesale submarkets, including electrical wholesalers.
- Modification of wholesale system for publishing and order fulfillment

b. Strategies

- Use Data General equipment to provide good cost/performance
- Use knowledge of electrical and other markets to maintain business
- Take advantage of surge of new business

c. Recent Activities

- Adapt software to needs of several retail markets to expand revenue

d. Future Directions

- Evaluate other submarkets for opportunities

7. GSI Transcomm, Pittsburgh, PA

a. Products/Services

- A set of application modules for DEC VAX computers known as the TOLAS product. The modules can be sold separately or as an integrated products. The products, which have on-line order entry/invoicing and inventory management modules, is used chiefly in distribution, although about 10% of clients are in other vertical markets.

- Timesharing, facilities management, and professional services

- An AI-based telemarketing system that could be of interest to some distributors

b. Strategies

- Provide application software for companies interested in DEC technology, particularly connectivity and on-line processing

- Customize TOLAS as required for each location and particularly to meet the needs of multilocation operations

- Utilize DEC's sales staff through a CMP (Cooperative Marketing Program) to sell products

c. Recent Activities

- Exploration of the use of AI (rule-based systems) in the TOLAS product

- Exploration of the use of the new OLTP software offered by DEC

d. Future Directions

- Integration of AI, rule-based applications in inventory management

8. Harris Data Services, Milwaukee, WI

a. Products/Services

- A set of software applications for IBM S/36, S/38, and AS/400 computers. The set handles manufacturing and distribution applications. The applications can be sold together or separately.

- Modules of the Wholesale Distribution System can also be sold separately or integrated.

- The Wholesale Distribution System can be delivered to meet the problems of four submarkets: food, building supplies, glass, and nursery distributors.

- Accounting and personnel software applications that can be sold to clients with other software or separately.

b. Strategies

- Maintain strengths—such as job costing, inventory control, and knowledge of MRP—that will appeal to manufacturers with problems .

- Target distribution niches or submarkets that have specific needs.

- Utilize knowledge of technology—such as connectivity, on-line transaction processing, EDI, and data management—to help sales or penetrate new markets.

- Help clients to convert data used by applications being replaced so valuable information will not be lost and the movement to new application systems will be facilitated. Three centers handle conversion applications in different regions of the country.

- Use a carefully designed telemarketing program to uncover prospects

c. Recent Activities

- Preparing to assist customers to move to AS/400 equipment

- Upgrading customer software to take advantage of OLTP on the AS/400

- Adding new capabilities to applications

d. Future Directions

- More use of EDI

- Entry into additional submarkets

9. Imrex, Great Neck, NY

a. Products/Services

- Integrated application software for the IBM 38 and AS/400. This software can meet the needs of a wide variety of submarkets as well as manufacturers with distribution needs.

- The software has been used for pharmaceutical, food, shoes, clothing, electrical, kitchen supply, health care, and car part wholesale applications.

b. Strategies

- Uses a well planned, intensive telemarketing system to sell application software

- Offers software with a wide range of accounting, ordering, and inventory control capabilities

- Provides strong capability for customizing applications

- Provides strong aid with conversion

c. Recent Activities

- Providing AS/400 capability
- Expanding applications to new submarkets
- Continuing to expand business rapidly

d. Future Directions

- Expanding manufacturing business and distribution associated with it.

10. Informed Beverage Management, Charlotte, NC

a. Products/Services

- Distribution and route accounting applications software for beer and soft drink dealers implemented on IBM 36 and AS/400 computers

- Processing services to support the same submarket

- Features of distribution software include sales analysis, trend analysis utilizing a three-year period, and the ability to handling discounting software

b. Strategies

- For bottle distributors, have application capabilities—including the ability to handle distributors with multiple locations and warehouses—more advanced than those of any other software or turnkey vendor
- Reduce costs by working with a vendor handling wine and spirits

c. Recent Activities

- Developing native application package for the AS/400

d. Future Directions

- Too busy to consider any new services or products

11. MCBA, Glendale, CA

a. Products/Services

- A set of modules that can handle order entry, purchasing, inventory management, sales forecasting, and accounting (accounts receivable, accounts payable, and general ledger) for small to medium wholesalers in many industry submarkets. The products can run on a variety of popular mini and microcomputers. Application software is also sold to the manufacturing and retail industries.
- Payroll, customer record buying, fixed-asset, account/ report writing, and other general applications that can be used for wholesalers or other customers
- Education and training at its headquarters location

b. Strategies

- Tries to achieve broad market coverage, controlled costs, and increased revenues for existing customers
- Offers application software that has a wide range of appeal in the wholesale sector. Many companies can find it possible to start with the MCBA products and consider customization later
- Makes its software available on a wide range of equipment (HP, DEC, Wang, AT&T, IBM) in order to reach a wide market
- Provides products that it does not have to modify but that companies can modify if they desire more customized applications, thereby keeping MCBA costs lower.

- Offers products on a wide basis through about 1500 dealers, resellers, and other agents

- Provides add-on software—such as payroll, administration, and training applications—to increase revenues from accounts

c. Recent Activities

- Added new application software products to its capabilities.

d. Future Directions

- No specific comments

12. Micro DataNet, Union, NJ

a. Products/Services

- Professional services
- Accounting software for PCs customized to wholesale needs
- Complete wholesale package for AS/400

b. Strategies

- Use knowledge of networking and LAN technology to penetrate wholesale accounts

- Offer wholesale application solutions with networked PC products or minicomputer systems, depending on size and wishes of prospect

c. Recent Activities

- Arrangements with an AS/400 application software vendor to offer the Micro DataNet wholesale system

- Development of expanded MIS application software capabilities to evaluate product, product line, and customer profitability

d. Future Direction

- Upgrade connectivity capabilities to maintain competitive edge

13. System Software Associates, Chicago, IL

a. Products/Services

- Integrated line of software for IBM System 38 and 36 computers designed for manufacturing, distribution, and accounting applications

- Support of just-in-time techniques in manufacturing software
- Wholesale distribution applications, including order processing, sales analysis, purchasing, forecasting, inventory management, and distribution resource planning (DRP).
- Financial products—including accounts receivable and payable, general-ledger, financial retrieval, and currency translation—that can be integrated with wholesale software

b. Strategies

- Sales are handled through a network of 30 to 40 affiliates responsible for product installation and support. SSA provides technical and marketing support and training for users.
- Products are aimed at mid-sized and larger companies, particularly discrete manufacturers with distribution needs. SSA takes primary responsibility for very large accounts.

c. Recent Activities

- Planning for expansion of products to AS/400

d. Future Directions

- Further development of application capabilities
- Expansion of geographic coverage

14. Unisol, Lyndhurst, NJ

a. Products/Services

- An application system that can be used by manufacturers, wholesalers, or large dealers in the jewelry industry
- A general-purpose system for wholesalers or mail order companies
- About 35% of total business is in wholesale distribution applications

b. Strategies

- Use the Pick operating system so that application software can be sold for large systems such as the IBM 9370, or small computers such as the Sanyo Icon, which run the Pick system

- Utilize the relational-like data management capability of the Pick system to aid with data management and retrieval needs
- Concentrate on jewelry business in New York and Los Angeles areas

c. Recent Activities

- Sales of two applications were both noted in the ICP five-million-dollar category in 1988.

d. Future Directions

- Expand marketing to other geographical areas

15. Verticomp, Chelmsford, MA

a. Products/Services

- Wholesale distribution package for micros that can be customized for hardware and plumbing wholesalers or for other submarkets
- Network knowledge and LAN capability

b. Strategies

- Use of the Pick system, which provides relational-like data management integrated with application processing
- Concentrate on marketing to a large number of wholesalers in region
- Use professional service capabilities to customize software to meet diverse needs

c. Recent Activities

- Working with users on distributed wholesaling applications

d. Future Directions

- Develop more capabilities to provide distributed solutions
- Prepare for increased power in micros that could lead to the displacement of minis in this cost-conscious sector

C
Other Vendor Activities

The intensive, well-planned use of telemarketing by Imrex and other vendors is an interesting vendor activity in this sector.

Some vendors in this sector have specialized capabilities for one submarket that might be used or modified for other submarkets. Routing management and the discounting applications of Beverage Management are examples of such a capability.

MCBA, Imrex, and other vendors in this sector do cross-sell additional services such as payroll, administration, or bank-related services on payment to customers.

Specialized data conversion services are also offered by vendors such as DMS of North Carolina and Harris Data Service.

Another activity of interest in this sector is the marketing of IS services developed by users. This is a means of offering the specialized applications needed by wholesale submarkets.

- Abbot Laboratories operates a computerized drug delivery system for other suppliers as well as itself.

- One wholesaler of business supplies, Summit Office Supply, markets the software that it developed for ordering and accounting. It has sold one system to a Fortune 100 firm.

Some vendors market the products of other firms as part of their offerings in this sector. Such arrangements allow vendors to have a larger product line and expand revenue.

IV

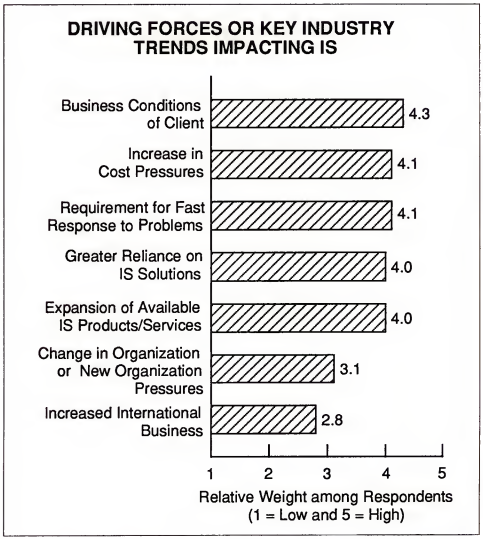
User Issues and Directions

A

Major Issues in Wholesale Distribution

According to firms in wholesale distribution, the driving forces or key trends that had an impact on IS programs are ranked in Exhibit IV-1.

EXHIBIT IV-1



- The two issues highest ranked by IS management in this sector were the business conditions of the manufacturers, retail firms, or other organizations that are IS clients, and the increasing cost pressures clients feel. These driving forces, which relate to the revenues and costs of wholesalers, indicate a strong sensitivity to bottom-line performance.

- Increases in manufacturing business or the rising sales of certain goods led to system improvements to meet customer service needs or to help control costs of the wholesale distributor. Depressed business could also lead to systems to control and help lower costs.

- Major cost pressures listed by wholesalers as driving forces were the cost of managing inventory, providing rapid response to customer orders or inquiries, and handling paper work.

- Another trend that IS managers report is a faster response to problems with information technology. If there is a significant need to transmit data from orders to remote warehouses, resources will be deployed to accomplish it. If ordering and payment can be improved through EDI, distributors will want to take steps to initiate it, according to IS management.

- The trend to rapidly deploy solutions to problems indicates that companies in this sector have more reliance on DP solutions. This requires that IS staffs be prepared to conceptualize more-complex applications as well as simple ones, and that staffs be prepared to work with vendors when additional expertise is needed.

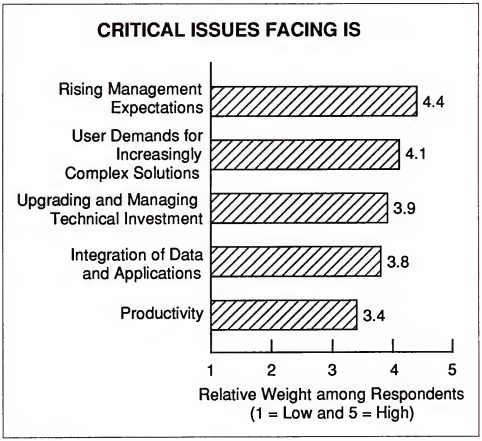
- The expansion of new IS capabilities that IS management views as key trends in the industry underlies the ability to rapidly deploy solutions. New OLTP systems for smaller computers, more-effective integrated application software, less costly relational data management systems, and means or connectivity are being introduced regularly. This expansion, another driving force impacting IS, requires that thought be given to an information architecture or business system plan that will make sense to operating management of a company as well as to IS.

- International competition is a trend that has increasing impact on IS planning. Interaction with foreign firms or over international borders requires new capabilities and the support of standards that aid international distribution problems such as EDI.

- Changes in organizational structure through mergers, acquisitions, and the changing role of end users is a driving force that has an impact on IS and that IS management is very sensitive about. If possible, IS should anticipate possible changes to the organizational structure by incorporating flexibility in the IS strategy and by being able to present and review the IS strategy in relation to new sources of direction in the company.

Based on responses from IS executives in wholesale distribution organizations, the critical strategic issues that affect IS programs shown in Exhibit IV-2 were ranked.

EXHIBIT IV-2



- The chief issue identified for this sector, rising management expectations, has also been identified as the leading major issue affecting IS in INPUT's *ISP Planning Report.*

- In wholesale distribution, the pressure of management expectations is evident.

  - The Vice President of Information Systems at a large retail clothing company noted that within the last year his management expected him to upgrade and integrate his order entry system, consolidate installations, connect remote sites, install EDI, and aid management in planning meetings with retail stores in order to obtain POS data from them. He referred to management expectations as mushrooming.

  - Management in a business supply distribution organization noted that it was increasing its reliance on IS as the means for relieving cost pressures and providing the services needed for customers.

- IS executives at two distribution operations associated with manufacturing felt that upper management had been much more concerned that plans proceed rapidly with or without aid from vendors to upgrade transaction processing capabilities to handle customer orders.

- Management of a food distribution operation taken over by a foreign conglomerate expected IS to immediately be able to supply more management-level information on revenues, costs, and profitability by products and customers. IS had to quickly seek the aid of a vendor with knowledge of software packages that might be used.

• The second major issue of IS management in this sector, user demands for increasingly complex solutions, is also identical to an issue identified in INPUT's *ISP Planning Report*.

- Users who originally demanded rapid response to needs for order entry, billing, or inventory management applications in distribution operations for industrial parts or consumer goods soon demanded integration of functions and connectivity with corporate data resources, remote warehouses, users, or suppliers—according to IS managers in this sector.

- One IS manager noted that users not only want him to collect POS data from stores to generate orders for customers but also want him to utilize complex modeling software to predict future customer needs.

- The CFO at a major food distributor noted that his company had given IS a challenge by seeking software to help control new warehouse equipment.

- Manufacturers and large independent wholesale distributors interested in modifying DRP applications or distribution network planning to meet new ideas in just-in-time planning also present a complex demand to IS management, according to a vendor.

• The third major issue of IS management in this sector, upgrading and managing technical investment, is similar to but not identical to the overall issue identified in the *ISP Planning Report, Managing Technical Investment*. IS management in wholesale distribution feels much more pressure to achieve capabilities that will allow technical investment to be managed properly.

- An IS manager at a wholesale operation that distributes goods to discount stores noted that the chief installation of equipment had to be upgraded to support the integration of applications and data.

- The IS executive of the clothing distributor who commented on the expectations of management in reference to the first major issue felt that immediate steps had to be taken with hardware and software to support management demands but that a plan had to be developed in parallel to support the investment taking place.

- IS management at distribution organizations handling industrial parts and pharmaceuticals also noted that management of technical investment required steps to upgrade resources or rescue certain applications, as one IS manager noted, before architectural planning could proceed.

• Integration of data and applications is an issue noted by both IS management in wholesale distribution and the *ISP Planning Report*. Integration has been a major issue in wholesale distribution for some time. On-line order entry requires access to up-to-date information on customer activity and items in inventory. Although this issue is well recognized, integration will continue to be a major issue in this sector.

• There are many integrated applications that need improvement in the techniques for integration and data files that contain extremely valuable information but that are not complete or support limited applications.

- Several vendors noted the need of many wholesalers to carefully convert existing sets of data to work with new, integrated applications so that valuable information will not be lost.

- An end-user executive at a pharmaceutical distributor and an IS executive at a company that manufactures and distributes pharmaceuticals and other products both feel that there will continue to be challenges and problems in the integration of data and that several stages of integration will result.

- Teradata, a vendor that specializes in equipment and system software to aid data management, has seen its business grow rapidly in this sector to address data management problems.

- Two other vendors specializing in CASE and data resource management feel that wholesale distribution is a sector much in need of professional expertise to aid in the integration of data and applications.

• A major issue identified by IS management that is not directly identified in the *ISP Planning Report* is productivity. This lack of identification may be due to the fact that end users are more prone to initiate activity to solve IS problems in this sector when a backlog delays response. IS management has chosen to let users proceed with vendor aid in certain situations and to have IS implement an expedient solution in other cases.

- An IS executive in a firm handling chemical and pharmaceutical distribution noted that end users had to receive attention and response, or it would be impossible to proceed with an architectural plan to meet their major needs. He has utilized an information center, aid from professional service firms, and techniques in software engineering and generation to meet end-user needs.

- A number of vendors noted that end users in this sector would consider vendor products or services when IS could not respond to requests.

- The IS executive of a firm handling the distribution of clothing to retail stores felt it necessary to consider expedient solutions such as the use of a vendor package on a PC to meet certain urgent user needs when his organization could not respond.

IS management did not respond to the issue of delivering mission-critical systems, which was identified in the *ISP Planning Report*, although several IS executives noted that they expected a more complete total system to evolve for submarkets in this sector.

- However, the themes of fast response and service to clients, integration, improved data management, timely billing, and management of accounts receivable and accounting that can indicate results and measure performance are more evident in this sector due to narrow margins and competition.

B
IS Budget Analysis

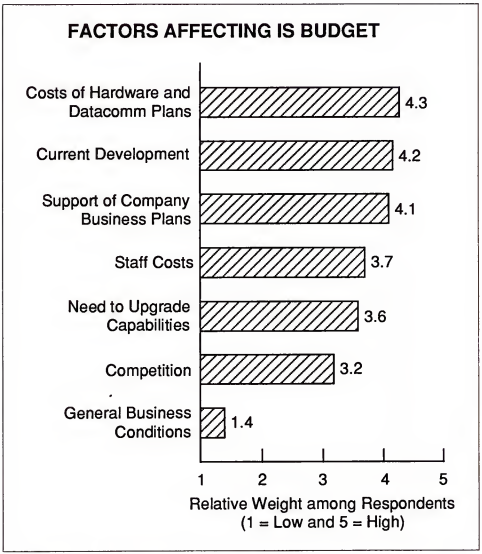
The primary factor affecting IS budgets in wholesale distribution is the cost of hardware and communication (or IS technology), as shown in Exhibit IV-3.

- The pressure to invest further in information system technology is required to meet major IS issues regarding management expectations and user demands for systems that will improve bottom line performance and service to customers.

- These issues also are reflected in the second budget factor updated by this sector, current system development, as well as in the factor related to the support of company plans.

The cost of technology as a budget factor is related to IS management's identifying "upgrading and management of technical investment" as a critical issue affecting IS programs, as shown in Exhibit IV-2.

EXHIBIT IV-3



Recognition of the budget impacts caused by current development and support of company plans, noted as important factors in Exhibit IV-3, indicate that IS feels that its contribution to the company's performance is increasingly valued.

- The mention of staff costs and the need to upgrade capabilities as budget factors shows the desire of IS to make a contribution and meet management expectations.

The relatively low rating attributed to general economic and business conditions emphasizes the increasing focus that IS management is giving to company performance and needs, rather than to external factors.

The budget for information systems should grow by about 5% on the average according to IS management, but this figure does not represent the total growth since many business units within wholesale companies

and subsidiaries have IS budgets and do not report expenditures for inclusion in the central IS budget. Many functions in this sector have maintained or increased their ability to control separate IS budgets.

The breakdown of the IS budget shown in Exhibit IV-4 indicates that personnel and hardware expenditures (42% and 29% in 1987) are slightly higher than average for all industries (40% and 28%) and the expenditures for external products and services are lower. This may be due to the fact that end users spend more on external services on the average than is true in other industries.

- The budget for communications is also increasing but does not reflect all end user plans.

The budget breakdown does indicate that expenditures for mainframes will decline in 1988 and 1989 relative to expenditures for minis and micros, which reflects the fact that more integrated systems for wholesale distributors are being offered on these smaller systems in the total marketplace.

The expenditures for processing services show a slight decline while expenditures for application software packages and turnkey systems will increase to meet the demands of the sector.

The IS budgets for respondent companies in this sector increased on the average as shown in Exhibit IV-5. A higher percentage of companies also report budget increases than companies in other sectors.

EXHIBIT IV-4

IS BUDGET— DISTRIBUTION AND GROWTH

Category	Percent			
	1987 Budget	1988 Budget	1988 Growth	1989 Growth
Personnel	42.0	41.0	2.0	1.0
Hardware				
Mainframes	13.5	13.0	1.0	2.0
Minicomputers	5.2	5.5	11.0	4.0
Micros	4.3	4.5	11.0	4.0
Mass Storage	4.0	4.0	5.0	5.0
Other	2.0	2.0	5.0	5.0
Total Hardware	29.0	29.0	5.0	-
Communications	10.5	11.5	12.0	8.0
External Products & Services				
Professional Services	1.4	1.5	12.0	10.0
Processing Services	1.2	0.9	(0.8)	(0.8)
Applications Software	2.2	2.5	5.0	5.0
Systems Software	2.5	2.5	5.0	5.0
Turnkey Systems	1.0	1.2	18.0	15.0
Software Maintenance	1.8	1.8	5.0	5.0
Hardware Maintenance	3.2	3.2	5.0	5.0
Other	0.7	0.5	(0.7)	(0.9)
Total External	14.0	14.0	5.0	-
Other	4.5	4.5	5.0	4.5
Total Budget	100.0	100.0	5.0	-

EXHIBIT IV-5

IS BUDGET GROWTH SUMMARY
(1988 Versus 1987)

Change	Percent of Respondents Wholesale Distribution
Increase	60
Decrease	10
Unchanged	30
Total	100

C
Application Development Trends

The existence of a development backlog is a key issue in regard to application development.

- The requests for new, improved applications are accompanied by demands for changes and maintenance to existing systems.
- The application backlog in wholesale distribution among survey respondents continues to be a significant issue, as shown in Exhibit IV-6, indicating the pressures to improve bottom line performance and implement improved applications that characterize this sector. A factor that should be considered in relation to the backlog however, is that many of the items included in the backlog may or will be handled by users or through user budgets.

Despite the existence of larger backlogs, a large division of internal resources is devoted to new applications in this sector, as illustrated in Exhibit IV-7, indicating pressure on the support or improvement of existing applications.

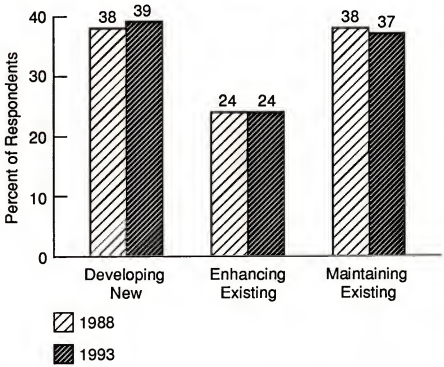
EXHIBIT IV-6

APPLICATION BACKLOG (1988 Versus 1987)

Change	Percent of Respondents Wholesale Distribution
Increase	45
Decrease	40
Unchanged	15
Total	100

EXHIBIT IV-7

APPLICATION DEVELOPMENT RESOURCES ALLOCATION OF INTERNAL RESOURCES



- This pressure on available resources has led to increased use of external software packages and turnkeys and increased participation of users in the development process and maintenance.

- Central IS in larger wholesale distribution organizations tends to exert more of a role in deciding when and if to use external resources. However, in smaller organizations, users and management may tend to bypass IS management more often or take the IS manager to a vendor with an attractive solution, as reported by vendors. Several IS managers in mid-sized and larger organizations said it was necessary to be responsive or join users when they went to visit vendors in order to participate in, if not influence, decisions.

A greater reliance on the use of external resources is shown in this sector than in others, as illustrated by Exhibit IV-8. External or a combination of external and internal resources are used for over one-fourth of development projects.

EXHIBIT IV-8

APPLICATION DEVELOPMENT— SOURCE OF RESOURCES

1. Type of Source

Category	Percent of Respondents	
	Wholesale Distribution	All Industries
Internal	73	76
External	10	9
Combination	17	15

2. Type of Development

Category	Percent of Respondents	
	Wholesale Distribution	All Industries
Package Software	38	36
Custom Development	62	64

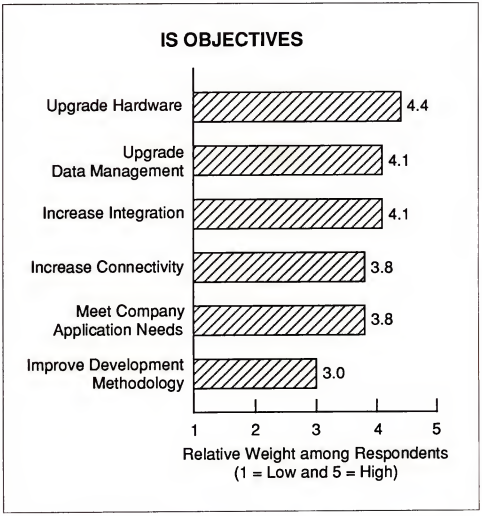
- In many small firms in this sector, the average would be much higher since they rely heavily upon vendors.
- Many firms in this sector rely upon the knowledge of vendors in applications involving the use of technology such as EDI, obtaining POS data from customers, data management, and OLTP, as well as in certain areas of application knowledge such as inventory management, order entry, DRP, discounting, or forecasting.

The greater reliance upon the use of packaged software in this sector illustrated in Exhibit IV-8 also testifies to the reliance upon vendor capabilities.

D
Objectives and Plans

The objectives of IS, listed in Exhibit IV-9, reflect the major issues, in general, that IS management reported in relation to budget plans (Exhibit IV-2).

EXHIBIT IV-9



- Objectives involved with increasing capabilities such as upgrading hardware, connectivity and data management, and the objectives of meeting company business needs are related primarily to the issue of "increasing management expectations," as well as to "user requests for more complex systems". Both require upgraded technology to be accomplished.

- Objectives concerned with research into improved development methodology also reflect the issue of user requests, as well as the backlog faced by IS.

IS management has been asked or told by management to increase its contribution towards company goals and has set its objectives accordingly. However, unless IS can obtain the confirmation of management regarding what target systems are critical to the business and ascertain the willingness of management to use external resources, IS will probably find it difficult to make a successful contribution.

IS also has objectives for general application needs; these are generally involved with order entry and/or inventory management problems, but forecasting, warehouse automation, routing, and purchasing were also mentioned.

The mention of specific application needs illustrates the concern of IS management about its contribution, as well as the pressure of a backlog.

The new application areas reported by IS in Exhibit IV-10 focus upon standard needs, such as on-line order entry and inventory management and control, although improved data management, EDI, and warehouse automation are mentioned.

The responses about inventory applications reflected the range of inventory needs in this sector. One company indicated plans to develop a DRP-type system to plan inventory replenishment on the basis of new forecasting techniques. Others stressed planning for new systems to reduce inventory costs or speed up the movement of inventory. There was also interest in applications that facilitate the use of new warehouse technology, such as bar coding and wands to manage the inventory of large durable goods, and professional assistance to support new conveyor operations at a manufacturer of food products.

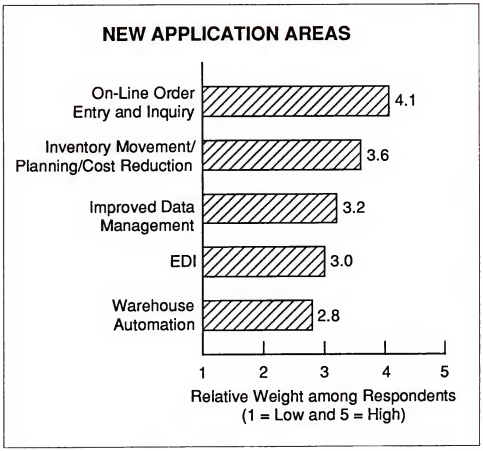
Overall, new applications did not reflect an emphasis on systems to address total company needs or make a significant change in company business or competition (mission-critical types of systems).

Plans for the use of new technology accentuate the interest of IS management in upgrading hardware to provide a better basis for technology plans, but also emphasize rising interest in EDI as well as plans to

address data management needs with relational systems. The focus of some firms on inventory management problems also led to comments on warehouse technology and optical storage (CD ROM) systems to aid in storing inventory information.

Several mentions of CASE and advanced programming languages pay tribute to the desire of IS to find means of reacting faster to management pressure and user requests.

EXHIBIT IV-10



V

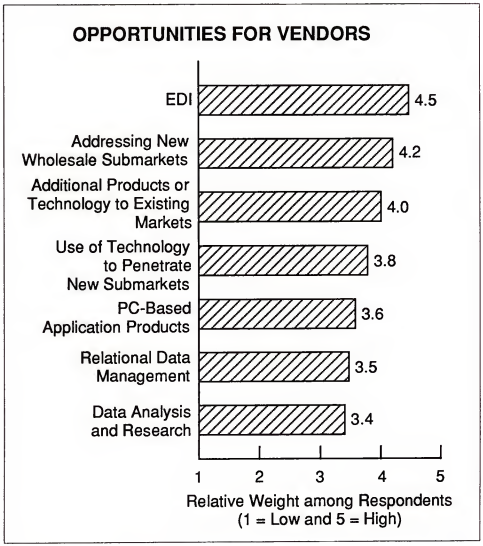
New Opportunities

A

Opportunities for Vendors

Based on information from users and vendors in this sector, the list of opportunities for vendors shown in Exhibit V-1 was developed.

EXHIBIT V-1



EDI was identified as a major opportunity in this sector since the use of electronic data between wholesalers and their customers or suppliers can reduce processing steps and costs, particularly expensive paper processing costs, the length of time that customers wait for goods, and the costs of inventory.

EDI opportunities for vendors include:

- Supplying IS products and services that will enable customers of wholesalers to automatically order and wholesalers to respond with electronic data describing order receipt, goods shipped and their present status or location, inventory outs, likely shipment dates, ordering and shipping recaps, and bills. Expert or rule-based systems could be used to monitor inventories and operations to generate orders.

- Obtaining POS (point of sale) data from customers in retail operations that can help a wholesaler forecast customer needs or generate orders.

In order to take advantage of these opportunities, vendors will have to educate clients about the benefits of EDI and how to initiate its use.

Some users suggested that presentations by vendors that describe how EDI or other more complex applications in inventory management could be implemented and used to advantage would be desirable.

Another major opportunity for a large number of vendors is to increase the number of market segments that they serve. The capabilities that a vendor may have in inventory management, integration of functions, order entry, or accounting can be utilized in some other submarkets in wholesale distribution or other market sector.

Several vendors noted they were so busy adding features for the submarket they served, that they had no time to enter new areas where they admitted their earnings could increase more rapidly.

- Imrex, Harris Data Services, and Global Turnkey have concentrated on entering multiple submarkets to do this.

- Distribution Management Systems (DMS) of North Carolina has also found it very easy to extend its services from automotive parts to other areas of wholesale distribution that have inventory management problems.

Another opportunity is to offer additional products in the same market.

- Triad added a network service, electronic information, to the products being offered in its market.

- A group of vendors, including American Software and Verticomp, have added professional service to their software or turnkey products.

- DMS (NC), Imrex, and Harris Data Services offer conversion services to their markets. Harris has three centers available to handle conversion work.

- Some vendors, including MCBA, have added payroll and other accounting or administrative services to the products they market to customers in this sector.

Vendors that are trying to bring their expertise to new markets could use technology to penetrate those markets and then introduce their traditional products. Technical expertise can be effective in penetrating new markets.

- Micro DataNet has used its capability in LAN connectivity to penetrate wholesale establishments and sell wholesale systems or customized accounting software.

- A number of vendors are using their ability to improve on-line order entry to penetrate new markets.

A means for expanding services that should be considered by many vendors is offering a downsized version of part or all of their applications on a PC or workstation.

- One vendor who mentioned that this was a possibility stated that, like many other vendors, he was afraid such a product would take orders away from his company's minicomputer turnkey.

- If vendors are not prepared to offer such a product, they will encounter competitive products at some of their accounts, according to an vendor who offers both mini- and PC-based application software. This vendor, who offers customized PC software packages for food distribution, stated that he also represented another mini-based vendor with AS/400 software for prospects who needed or wanted larger hardware systems.

One means for offering a PC-based product with a subset or almost comparable features to a larger system (or for offering additional products such as systems software) is through an alliance or agreement to represent the products of other firms.

A number of vendors expect to find a significant portion of application software product sales on micro or workstation products by 1993.

Several vendors, including DMS of North Carolina, pointed out that advances in capabilities for managing and controlling inventory has always represented an opportunity to vendors.

- Advances in capabilities might entail adding distribution resource planning or distribution network techniques to help meet needs of clients (see Appendix A-1 and A-2).

- Advances could also refer to forecasting features to help plan inventory levels, or the use of improved means of data management.

The introduction of improved data management capabilities is a growing opportunity in this sector, particularly for larger distribution organizations, according to vendors serving this sector.

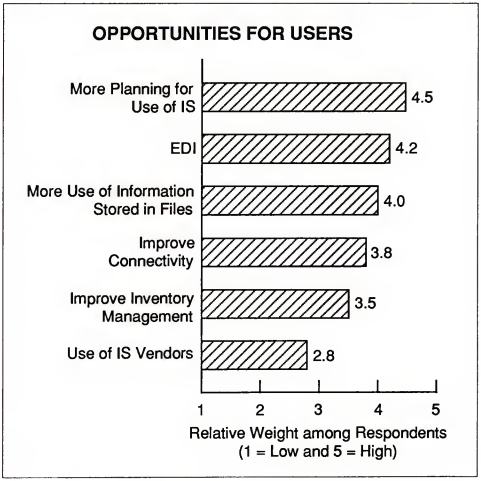
- Several vendors stressed the need for relational data management systems in larger distribution functions. They feel that the need to reference data for a variety of purposes, including forecasting, order generation, customer service, and profitability analyses requires relational capabilities.

B

Opportunities for Users

Information from users and vendors utilized to develop Exhibit V-2 indicates major opportunities exist for most users in working with management to develop plans for the use of IS in a wholesale company.

EXHIBIT V-2



- Information on product usage or customer buying patterns has enabled companies in some submarkets to devise programs to increase sales.

- Warehouse and transit costs associated with products have been analyzed with models on a PC to uncover opportunities for savings in a chemical company.

Information from users and vendors also indicates that EDI is an opportunity for users to lower costs and increase customer service, as outlined in the previous section, V-A. In addition to the benefits described there, EDI also provides a means for wholesalers to develop tighter links with their customers.

An opportunity that users should consider is developing effective sales analyses with the information stored on clients, prospects, and products in their market areas.

- More information on products has been made available to customers as part of inquiry services by a number of wholesalers.

Further use of the corporate information resource has indicated to some users that an opportunity exists to improve data management or to consider the use of relational data base capabilities.

In many wholesale companies, an opportunity exists to install LANs and improve connectivity between functions or to establish connectivity with remote warehouses or customers. Interim links between PCs may provide a start, but plans should proceed to develop complete networks when required.

Users can uncover opportunities to manage and control their inventories more efficiently and economically by investigating the applications that vendors have developed. One user commented that it was an education to review and have a demonstration of a new purchasing management system and a distribution resource planning product.

A general opportunity today may be for users to encourage company management to seek aid from vendors to upgrade order entry or inventory management, to introduce OLTP, or to replace unintegrated applications. The backlog that exists in most IS departments in this sector makes this opportunity more appealing.

- In view of desires to meet near-term cost pressures or customer needs, management should be willing to use new technology or to expand the use of external resources.

- Management should recognize that a major need exists to plan and install a new set of integrated applications and data base and on-line order entry systems rather than react to piecemeal requests.

It also makes sense for the company to expand the end user's role in system development to obtain needed applications.

Overall, users must recognize that a valuable opportunity exists to spend some time in considering total needs and planning an architectural approach to take advantage of new technology, rather than always reacting to needs and the competition in short-term steps.

A

Appendix: Definitions Pertinent to Wholesale Distribution

A

Distribution Resource Planning (DRP)

DRP was developed from the MRP concepts that were introduced about fifteen years ago.

DRP utilizes sales forecasts to identify demand on distribution centers and the resulting impact on resupply facilities, as well as to report transportation loading and scheduling information

- Demand on distribution centers feeds DRP modules that handle purchasing and inventory management which determine the size and frequency for inventory replenishments.
- DRP enables warehouse management to prevent stockouts or overages and to reduce inventory costs. Reports are also produced that enable costs to be analyzed by product or product line and service to be analyzed by customer.
- DRP can reduce warehousing inventory and transportation costs.

DRP can be used to monitor manufacturing output through storage and delivery.

New DRP modules or separate systems are beginning to use "expert" or rule-based logic to predict reorder times and quantities more exactly in relation to volume purchase, discounts, payment patterns, and customer histories.

B

Distribution Network Management

Distribution network management started as an application of linear programming techniques to the transportation industry to optimize the costs of delivering diverse types of freight to many locations over several possible modes.

It has been used with DRP to add a transportation component to operating cost planning and analysis.

The objectives of this technique are financial analyses and operations models aimed at increasing services (e.g., delivery frequency) while controlling or reducing costs (e.g., delivery, inventory holding).

It has been used in the wholesale distribution industry for modeling such variables as delivery frequencies, multilocation inventory stocks, backhaul opportunities, freight budgets, delivery routes and alternatives, fleet and equipment requirements, and cargo planning.

This technique has resulted in increases in vehicle fill rate of as much as 50%.

C

Electronic Data Interchange (EDI)

EDI is the application-to-application exchange of intercompany business data in standard formats. It can involve automatic ordering by computers at a customer's location: automatic order confirmation and shipment information transmitted to the buyer from computers at the seller's location and automatic billing and payment as a result of prior actions.

Despite the potential of EDI for wholesalers, its use has been delayed by attention given to immediate problems, cost pressures, and the lack of information about means of taking advantage of EDI.

Interest in EDI is beginning to grow in wholesaling as more customers demand or ask about using it.

The potential for cost reduction is enormous, simply through reducing labor requirements for data re-entry and thereby eliminating errors caused by rekeying. Users have estimated potential cost reduction in these areas of as much as 70%.

B

Appendix: Wholesale Distribution Sector Data Base

EXHIBIT B-1

WHOLESALE DISTRIBUTION SECTOR
USER EXPENDITURE FORECAST BY DELIVERY MODE, 1988 - 1993
($ Millions)

Sector by Delivery Mode	1987	Growth 87-88 (%)	1988	1989	1990	1991	1992	1993	CAGR 88-93 (%)
Total Wholesale Distribution Sector	1,355	19	1,615	1,900	2,260	2,685	3,225	3,885	19
Processing Services	305	8	330	360	400	440	480	520	9
Transaction Processing Services	255	7	270	300	330	360	390	420	9
Systems Operations	50	12	60	60	70	80	90	100	11
Network/Electronic Information Services	110	26	140	195	260	370	520	730	40
Electronic Information Services	30	19	40	50	50	60	70	80	17
Network Applications	80	29	100	145	210	310	450	650	46
Application Software Products	290	32	390	465	580	705	875	1,090	23
Mainframe	160	30	210	230	270	300	340	390	14
Minicomputer	80	21	100	125	150	185	225	270	22
Workstation/PC	50	56	80	110	160	220	310	430	40
Turnkey Systems	320	14	365	410	460	510	570	625	11
Systems Integration	90	25	110	140	170	210	250	310	23
Professional Services	240	18	280	330	390	450	530	610	17

C

Appendix: Wholesale Distribution Industry Forecast Reconciliation

The primary difference between the 1987 and 1988 estimates of the 1987 processing/network services market stems from the many cross-industry applications used by the wholesale industry (e.g., credit authorization services) that were included in the 1987 wholesale processing/network services estimate. These applications are now included in the cross-industry processing/network services market. In addition, the processing services portion of processing/network services, which is now broken out separately, has not grown as fast as previously forecasted.

The 1988-1993 CAGR projected for processing/network services is significantly higher in the 1988 report than in the 1987 report. The most significant gains will be in network services.

The application software products market has been increased to represent a higher than expected growth rate for 1987. This market continues to build momentum, as shown in the higher CAGR forecasted for 1988-1993. The higher growth in this area is forecasted for microcomputer applications.

The turnkey systems market was underestimated in 1987 and in earlier years, shown in the large discrepancy between estimates shown in the 1987 and 1988 reports.

The higher growth projected for turnkey systems indicates an increased penetration of small and medium-sized firms that are installing micro or minicomputers to perform integrated distribution functions.

The difference between the 1987 professional services market estimate reported in INPUT's 1987 and 1988 reports represents, for the most part, the systems integration market reported as part of the professional services market in 1987. In 1988, INPUT broke out systems integration activities separately and included hardware expenditures, which were not included in 1987.

EXHIBIT C-1

WHOLESALE DISTRIBUTION SECTOR
DATA BASE RECONCILIATION
OF MARKET FORECAST, BY DELIVERY MODE
($ Millions)

Industry Sector	1987 Market			1992 Market			CAGR 87-92	CAGR 87-92
	1987 Forecast	1988 Forecast	Variance (%)	1987 Forecast	1988 Forecast	Variance (%)	1987 Forecast (%)	1988 Forecast (%)
Total Wholesale Distribution Sector	1,554	1,265	23	2,949	2,975	-0	14	19
Processing/Network Services	425	415	2	749	1,000	-25	12	19
Application Software Products	373	290	29	834	875	-5	17	25
Turnkey Systems	306	320	-4	429	570	-25	7	12
Professional Services	450	240	88	937	530	77	16	17

Note: INPUT's 1987 Professional Services forecast includes Systems Integration software revenues.

EXHIBIT C-2

WHOLESALE DISTRIBUTION SECTOR
USER EXPENDITURE FORECAST BY DELIVERY MODE, 1988 - 1993
($ Millions)

Sector by Delivery Mode	1987	Growth 87-88 (%)	1988	1989	1990	1991	1992	1993	CAGR 88-93 (%)
Total Wholesale Distribution Sector	1,355	19	1,615	1,900	2,260	2,685	3,225	3,885	19
Processing Services	305	8	330	360	400	440	480	520	9
Transaction Processing Services.	255	7	270	300	330	360	390	420	9
Systems Operations	50	12	60	60	70	80	90	100	11
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Electronic Information Services	30	19	40	50	50	60	70	80	17
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Systems Integration	90	25	110	140	170	210	250	310	23
Professional Services.	240	18	280	330	390	450	530	610	17

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INPUT provides planning information, analysis, and recommendations to managers and executives in the information processing industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions.

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